Radiation Safety Program

A Proactive Approach

NASA's comprehensive safety program addresses potential hazards in the workplace before any work begins.

Minimizing Exposures

ALARA

or As Low As Reasonably Achievable, is the industry standard and is at the heart of NASA's Radiation Safety Program. ALARA Reviews are performed in advance of the start of any job that has the potential for radiation exposure. NASA uses ALARA and other safety reviews to specify the engineering controls and personal protective equipment necessary to protect worker health and safety.

ALARA
As Low As
Reasonably Achievable

- Minimize radiation exposures to workers and others entering a controlled area; and
- Make deliberate efforts to reduce radiation exposures to as low as reasonably achievable taking into account social, technical, economic, practical and public policy considerations.

Workers are equipped with personal protective equipment including coveralls, boots, hardhats, gloves, hearing and eye protection, and full-face respirators when necessary.

Posted Areas

Radiation areas have been posted and are identified with signs that display the conventional radiation warning symbol and give specific information about entry requirements.

Exposure refers to the amount of radiation energy that reaches an object's surface (the worker's body) in a given time period. It can reach a worker through

Direct contact **or** By movement of radioactive substances through the air, soil, surface water or groundwater.

There are two types of potential exposure:

EXTERNAL occurs when radiation (a type of energy wave or particle) penetrates the body.

INTERNAL occurs when radioactive material like dust or liquid, referred to as loose contamination, is taken into the body through breaks in the skin or by eating, drinking or breathing.

Three types of radiation are present:

Radiation	Exposure Potential
Alpha radiation is made up of particles that include two neutrons and two protons each. Alpha radiation travels only a few inches in air. A sheet of paper or skin will block alpha radiation, but it is harmful if it is taken into the body through eating, drinking or breathing.	Internal if inhaled
Beta radiation particles are smaller, though they have more energy than alpha particles. Beta radiation can travel up to 12 to 15 feet in air and can penetrate skin. About an inch of shielding - glass, wood, plastic or metal - will stop most beta particles.	Internal; External only to skin & eyes
Gamma radiation is made up of energy waves similar to light or radio waves but with more energy. It can travel great distances and penetrate matter. Gamma radiation can damage the human body. Concrete or lead is typically used to shield people from gamma radiation.	Internal and External